Name: _____   Date: _____
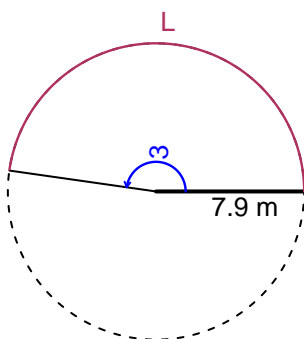
Trig Final (TEST v609)

- You should have a calculator (like Desmos) and a unit-circle reference sheet.

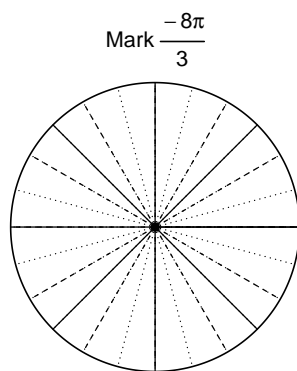## Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The radius is 7.9 meters. The angle measure is 3 radians. How long is the arc in meters?
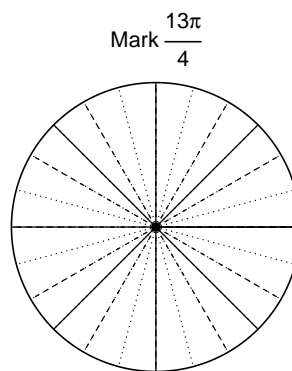

Question 2

Consider angles $\frac{-8\pi}{3}$ and $\frac{13\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\cos\left(\frac{-8\pi}{3}\right)$ and $\sin\left(\frac{13\pi}{4}\right)$ by using a unit circle (provided separately).

Mark $\frac{-8\pi}{3}$

Find $\cos(-8\pi/3)$

Mark $\frac{13\pi}{4}$

Find $\sin(13\pi/4)$

Question 3

If $\sin(\theta) = \frac{72}{97}$, and θ is in quadrant II, determine an exact value for $\tan(\theta)$.

Question 4

A mass-spring system oscillates vertically with an amplitude of 2.43 meters, a frequency of 5.45 Hz, and a midline at $y = 3.83$ meters. At $t = 0$, the mass is at the minimum height. Write an equation to model the height (y in meters) as a function of time (t in seconds).